## COTTON REGION REPORTS.

The following table gives the average rainfall, mean of the maximum and mean of the minimum temperatures, in each of the cotton districts, as shown on the chart issued with the April REVIEW.

*Meteorological Record of the Cotton Districts for the month of October, 1882.*

| DISTRICTS. | Average rainfall in inches. | Mean of the maximum. | Mean of the minimum. |
|---|---|---|---|
| New Orleans | 2.64 | 81.9 | 62.0 |
| Savannah | 4.95 | 80.0 | 61.0 |
| Charleston | 4.41 | 78.2 | 55.3 |
| Atlanta | 2.04 | 76.2 | 56.1 |
| Wilmington | 3.08 | 75.2 | 53.5 |
| Memphis | 2.02 | 78.3 | 54.6 |
| Galveston | 5.73 | 82.6 | 60.4 |
| Vicksburg | 4.21 | 79.8 | 56.8 |
| Montgomery | 2.28 | 79.8 | 58.0 |
| Augusta | 2.64 | 77.5 | 57.4 |
| Little Rock | 4.34 | 78.3 | 54.5 |
| Mobile | 2.34 | 81.7 | 58.3 |

## WINDS.

The prevailing direction of the winds during the month of October, 1882, at Signal Service stations, are shown on chart ii., by arrows flying with the wind. Along the Atlantic coast, the prevailing winds are from the northeast. Throughout the remainder of the country, east of the Rocky mountains, they are, with but few exceptions, southerly. In the north Pacific coast region, they are from the south and southwest, and in the Middle and South Pacific coast regions from the south, west, and southwest.

### TOTAL MOVEMENTS OF THE AIR.

[*In miles.*]

The following are the largest total movements at the Signal Service stations: On the summit of Mount Washington, New Hampshire, 23,954; on the summit of Pike's Peak, Colorado, 20,813; Portsmouth, North Carolina, 13,477; Hatteras, North Carolina, 12,895; Kittyhawk, North Carolina, 12,632; Delaware Breakwater, 11,711; Block Island, Rhode Island, 11,353; Cape Henry, Virginia, 10,684; Barnegat, New Jersey, 10,518; Sandy Hook, New Jersey, 10,279; Fort Macon, North Carolina, 9,849; Eagle Rock, Idaho, 9,864; Cape May, New Jersey, 9,475; Fort Shaw, Montana, 9,452; Dodge City, Kansas, 9,407; Port Eads, Louisiana, 9,382; Galveston, Texas, 8,934; Fort Assinniboine, Montana, 8,617; Indianola, Texas, 8,530; Sandusky, Ohio, 8,470; Duluth, Minnesota, 8,320; Mackinac City, Michigan, 8,002. The smallest total movements are: Lynchburg, Virginia, 1,546; Morgantown, West Virginia, 1,708; Silver City, New Mexico, 1,775; Lewiston, Idaho, 1,997; Williamsport, Pennsylvania, 2,035; Visalia, California, 2,218; Washington, District of Columbia, 2,494; Uvalde, Texas, 2,597; Fort Missoula, Montana, 2,655; Dubuque, Iowa, 2,676; Tucson, Arizona, 2,761; Augusta, Georgia, 2,832; Cincinnati, Ohio, 2,969; San Antonio, Texas, 2,978.

### HIGH WINDS.

Maximum velocities of fifty miles per hour or more have been reported, as follows:

On the summit of Mount Washington, New Hampshire, 56, nw., 1st; 80, nw., 2d; 60, nw., 3d; 80, nw., 4th; 65, nw., 7th; 60, nw., 8th; 73, w., 9th; 90, w., 10th; 62, nw., 11th; 60, nw., 14th; 64, s., 16th; 62, sw., 17th; 53, s., 22d; 78, nw., 25th; 86, nw., 26th; 66, nw., 27th; 100, s., 29th (maximum for month); 66, nw., 30th; 84, w., 31st.

On the summit of Pike's Peak, Colorado, 56, w., 2d; 54, sw., 3d; 52, sw., 5th; 72, w. 10th; 84, w., 11th; 64, sw., 14th; 56, w., 15th; 52, w., 16th; 54, sw., 21st; 54, n., 22d; 62, w., 24th; 64, sw., 25th; 68, w., 26th; 53, nw., 27th; 56, w., 28th; 96, sw., 29th (maximum for month); 60, sw., 30th.

Portsmouth, North Carolina, 56, ne., 12th.
Cedar Keys, Florida, 56, s., 10th.
Cape Henry, Virginia, 56, n., 24th.
Eagle Rock, Idaho, 54, w., 12th.
Kittyhawk, North Carolina, 52, ne., 12th.
Galveston, Texas, 52, n., 19th.
Milwaukee, Wisconsin, 52, s., 30th.
Fort Keogh, Montana, 52, w., 27th.
Umatilla, Oregon, 51, w., 11th.
Fort Maginnis, Montana, 50, w., 27th.

### LOCAL STORMS.

*California:* A destructive wind and rain storm occurred in the state, on the 2d. The following notes are given in connection with it: Marysville: The wind caused much damage to trees; large quantities of fruit were blown from the trees. Chico: Trees and shrubbery were blown down. The wind attained a hurricane-like force. North San Juan: The storm was very fierce in this vicinity, but there was no serious damage to property. Stockton: The storm continued with extreme violence for fifteen hours; several buildings were damaged, and many trees were blown down. San Francisco: The storm did some damage to vessels in the bay; one barge was capsized. The sea was very rough. Sacramento: This was the heaviest October storm ever recorded here. It approached very suddenly, and the barometer did not fall until the storm had reached this locality. The damage to the wheat, hay, and grape crops is estimated at $400,000. The greatest damage was done in the Sacramento, San Joaquin, and Napa valleys, and was caused by the heavy rains. Some bulkheads and many shade trees were blown down.

*Iowa:* A tornado occurred about five miles east of Davenport, on the afternoon of the 30th. At 3.30 p. m., two funnel-shaped clouds were observed to unite at a point about five mills northeast of Davenport; the tornado-cloud then moved by a zig-zag course through Scott county in a northeasterly direction toward Princeton, where it appears to have expended its energy. The path of the tornado was about one quarter of a mile wide and about eighteen miles long; the cloud appeared to rise and fall, striking the earth at intervals, when it caused much damage. Three houses were totally demolished, and thirty dwellings and barns were unroofed or seriously damaged; hay-stacks were carried away and farming implements were much damaged. The total loss is estimated at $60,000. Two persons were fatally injured by falling ruins, and six others sustained more or less serious injury. At Davenport, the storm was unattended by wind, but hailstones of unusual size fell (see hail storms), and the atmosphere was warm and sultry. Persons in East Davenport stated that a sullen, roaring noise was heard at that place, immediately before the formation of the tornado-cloud.

*Kansas:* A storm, accompanied by high wind, occurred at Fort Scott, on the 30th. Many signs were blown down, and other slight damage was done.

*Minnesota:* On the 12th, the wind reached a velocity of forty-eight miles an hour, at Saint Paul. The State Armory building was blown down, and much damage was done to trees and fences.

*Missouri:* A heavy wind storm occurred at Boonville, on the afternoon of the 12th. The damage to property was slight.

*New York:* During a heavy gale that occurred over Lake Erie, on the 29th, several schooners sustained more or less damage. Much damage was done on the Canadian shore by this storm.

*Texas:* A heavy wind storm, accompanied by thunder and lightning and torrents of rain, occurred at Dallas, on the night of the 15th. The wind caused much damage to trees, fences, and houses, and especially to the cotton crop.

## VERIFICATIONS.

### INDICATIONS.

The detailed comparison of the tri-daily indications for October, 1882, with the telegraphic reports for the succeeding twenty-four hours, shows the general average percentage of verifications to be 86.03 per cent. The percentages for the four elements are: Weather, 87.28; direction of the wind, 83.06; temperature, 89.35; barometer, 84.39 per cent. By geographical districts, they are: For New England, 83.4; middle Atlantic states, 81.8; south Atlantic states, 87.3; east Gulf states, 86.5; west Gulf states, 88.0; lower lake region, 86.3; upper lake region, 91.2; Tennessee and the Ohio valley,

85.1; upper Mississippi valley, 87.9; lower Missouri valley, 81.0; north Pacific coast region, 91.7; middle Pacific coast region, 91.1; south Pacific coast region, 100.0.

There were one hundred and forty-four omissions to predict out of 3,813, or 3.79 per cent. Of the 3,669 predictions that have been made, one hundred and fifteen, or 3.11 per cent., are considered to have entirely failed; one hundred and eleven, or 3.03 per cent., were one-fourth verified; four hundred and forty-four, or 12.11 per cent., were one-half verified; three hundred and sixty-nine, or 10.06 per cent., were three-fourths verified; 2,630, or 71.69 per cent., were fully verified, so far as can be ascertained from the tri daily reports.

### CAUTIONARY SIGNALS.

One hundred and forty-four cautionary signals were displayed during the month of October, 1882, of which one hundred and sixteen, or 80.56 per cent., were justified by winds of twenty-five miles per hour, at or within one hundred miles of the station. Four cautionary off-shore signals were displayed, of which three, or 75.0 per cent., were fully justified; four, or 100 per cent., were justified as to direction, and three or 75.0 per cent., were justified as to velocity. One hundred and forty-eight signals of all kinds were displayed, of which one hundred and nineteen or 80.41 per cent., were justified. The above does not include signals ordered at sixty-nine display stations, where the velocity is estimated only. Nine signals were ordered late.

One hundred and twenty-one winds of twenty-five miles or more per hour were reported, for which no signals were ordered; many of these were high local winds, or strong sea-breezes.

## NAVIGATION.

### STAGE OF WATER IN RIVERS.

In the table on the right-hand of chart iii., are given, the highest and lowest stages of water observed at the Signal Service stations, during the month of October, 1882. In the first column of this table, are given, the heights of water on the gauge, which have been found dangerous to property at the stations.

The rivers have remained low during the month. In the Mississippi, from Cairo to Vicksburg, the highest stages occurred on the 1st; at New Orleans, from the 2d to the 5th; and at Port Eads on the 9th. In the upper Mississippi, the highest stages occurred during the latter part of the month. In the Ohio river, the highest water occurred from the 1st to 5th; and in the Missouri, from the 7th to 15th.

The observer at Chattanooga, Tennessee, reports that, during the whole of the past summer, the Tennessee river has remained navigable from that city to Decatur, Alabama. In former years, navigation has usually been suspended from July to November, but during those months of the present year, the river has remained at a good boating stage, and navigation has, at no time, been interrupted.

On the 19th, the Red river, at Shreveport, Louisiana, rose rapidly, and caused a suspension of work on the railroad bridge in course of construction at this place.

### HIGH TIDES.

Ocean City, Maryland, 24th. Very high tide, washing over the narrow peninsula in several places.

Hatteras, North Carolina, 13th. Very high tide, overflowing the lower part of the island.

Eastport, Maine, 1st, 2d, 3d.

Portsmouth, North Carolina, 1st, 2d, 12th, 24th.

Cape Lookout, North Carolina. 1st to 4th, 13th, 14th.

Fort Macon, North Carolina, 24th, 25th.

Cedar Keys, Florida, 11th.

Punta Rassa, Florida, 9th.

Port Eads, Louisiana, 8th, 9th, 10th.

### FLOODS.

But few floods have occurred during the month, and these were of local character.

Dallas, Texas. During a heavy rain storm which occurred on the 15th, all streams were swollen, and Trinity river rose at the rate of four feet per hour. Several bridges were swept away, and serious washouts occurred on the various railways.

Mobile, Alabama, 31st. Very heavy rain fell from 6.30 to 9.00 p. m.; streets were flooded and business was entirely suspended in the lower part of the town.

Palestine, Texas, 6th. A very heavy rain storm occurred, on this date, at Riverside, a station on the International and Great Northern railroad. Culverts and embankments were washed away, and other damage was done.

Saint Joseph, Missouri, 12th. During a heavy rain storm, the streets were flooded. Many bridges were washed away, and other damage was done.

Joplin, Missouri, 12th. The mines in the vicinity of this place were flooded by the heavy rain, causing delay of work for several days.

Georgetown, South Carolina, 20th and 21st. The heavy rains of these dates caused destructive floods in this vicinity, and much damage to the rice crop.

## TEMPERATURE OF WATER.

The temperature of water, as observed in rivers and harbors, at the Signal Service stations, and the average depth at which the observations were taken, are given in the table on the right-hand of chart ii. In the first column of the table, is given, the maximum temperature observed during the month; and in the second column, the minimum temperature observed during the same period.

The following are the greatest monthly ranges: 18° at Grand Haven, Michigan; 17°.4 at Milwaukee, Wisconsin; 17° at Galveston, Texas; 15°.8 at Indianola, Texas; and 15°.5 at Chincoteague, Virginia. The smallest are: 1° at Eastport, Maine; 2°.1 at San Francisco, California; 3°.3 at Toledo, Ohio; 4° at Smithville, North Carolina; 4°.2 at Port Eads, Louisiana., and 5° at New London, Connecticut.

The following table gives the highest and lowest temperatures of water at the several stations; the range of water temperature; the mean temperature of the air at the station; and the depth of water at which the observations were taken:

*Temperature of Water for October, 1882.*

| STATION. | Temperature at bottom. | | Range. | Average depth, feet and inches. | | Mean temperature of the air at station. |
|---|---|---|---|---|---|---|
| | Max. | Min. | | ft. | in. | |
| | ° | ° | ° | | | ° |
| Atlantic City, New Jersey | 67.3 | 60.0 | 7.3 | 7 | 5 | 60.8 |
| Alpena, Michigan | 59.5 | 43.7 | 5.8 | 11 | 5 | 50.2 |
| Augusta, Georgia | 76.0 | 63.5 | 12.5 | 6 | 0 | 67.8 |
| Baltimore, Maryland | 69.0 | 60.5 | 8.5 | 10 | 0 | 61.5 |
| Block Island, Rhode Island | 61.0 | 55.0 | 6.0 | 8 | 7 | 57.4 |
| Boston, Massachusetts | 59.4 | 53.0 | 6.4 | 25 | 0 | 54.6 |
| Buffalo, New York | 66.0 | 55.0 | 11.0 | 8 | 5 | 55.1 |
| Burlington, Vermont | 62.0 | 52.0 | 10.0 | 17 | 6 | 51.9 |
| Cedar Keys, Florida | 82.0 | 70.0 | 12.0 | 10 | 6 | 73.7 |
| Charleston, South Carolina | 74.7 | 67.4 | 7.3 | 41 | 3 | 69.5 |
| Chicago, Illinois | 66.7 | 52.1 | 14.6 | 8 | 0 | 56.6 |
| Chincoteague, Virginia | 73.5 | 58.0 | 15.5 | 6 | 3 | 62.7 |
| Cleveland, Ohio* | 64.7 | 55.6 | 9.1 | 14 | 0 | 56.3 |
| Detroit, Michigan | 65.0 | 52.0 | 13.0 | 24 | 2 | 57.8 |
| Delaware Breakwater, Maryland | 73.1 | 59.3 | 13.8 | 6 | 4 | 62.4 |
| Duluth, Minnesota | 60.0 | 51.0 | 9.0 | 15 | 7 | 49.1 |
| Eastport, Maine | 49.7 | 48.7 | 1.0 | 49 | 4 | 49.5 |
| Escanaba, Michigan | 66.0 | 51.0 | 15.0 | 15 | 0 | 50.9 |
| Galveston, Texas | 80.0 | 63.0 | 17.0 | 14 | 11 | 75.2 |
| Grand Haven, Michigan | 63.0 | 45.0 | 18.0 | 19 | 0 | 54.8 |
| Indianola, Texas | 83.4 | 67.6 | 15.8 | 9 | 7 | 75.9 |
| Jacksonville, Florida | 78.0 | 70.0 | 8.0 | 18 | 0 | 72.6 |
| Key West, Florida | 86.0 | 74.8 | 11.2 | 15 | 3 | 79.6 |
| Mackinac City, Michigan | 60.0 | 48.4 | 11.6 | 13 | 0 | 52.1 |
| Marquette, Michigan | 55.8 | 45.9 | 9.9 | 10 | 6 | 50.1 |
| Milwaukee, Wisconsin. | 65.5 | 48.1 | 17.4 | 8 | 0 | 55.8 |
| Mobile, Alabama | 78.5 | 73.0 | 5.5 | 14 | 7 | 71.4 |
| New Haven, Connecticut | 65.5 | 55.2 | 10.3 | 15 | 6 | 55.3 |
| New London, Connecticut | 63.0 | 58.0 | 5.0 | 12 | 6 | 56.7 |
| Newport, Rhode Island | 63.1 | 56.5 | 6.6 | 11 | 2 | 58.4 |
| New York City | 64.5 | 57.5 | 7.0 | 21 | 8 | 58.5 |
| Norfolk, Virginia | 73.0 | 60.0 | 13.0 | 18 | 0 | 64.1 |
| Pensacola, Florida | 77.7 | 71.1 | 6.6 | 18 | 0 | 71.2 |
| Portland, Maine | 56.0 | 50.0 | 6.0 | 21 | 0 | 54.3 |
| Portland, Oregon | 59.8 | 47.3 | 12.5 | 58 | 2 | 50.6 |
| Port Eads, Louisiana | 77.7 | 73.5 | 4.2 | 9 | 4 | 74.5 |
| Provincetown, Massachusetts | 59.5 | 53.0 | 6.5 | 14 | 0 | 55.8 |
| Punta Rassa, Florida | 85.0 | 75.6 | 9.4 | 11 | 7 | 76.3 |
| Sandusky, Ohio | 66.1 | 51.6 | 14.5 | 10 | 0 | 57.3 |
| Sandy Hook, New Jersey | 66.3 | 58.8 | 7.5 | 1 | 6 | 59.9 |
| San Francisco, California | 58.1 | 56.0 | 2.1 | 32 | 4 | 58.1 |
| Savannah, Georgia | 74.9 | 65.9 | 9.0 | 13 | 1 | 69.3 |
| Smithville, North Carolina | 72.0 | 68.0 | 4.0 | 10 | 0 | 66.6 |
| Toledo, Ohio | 67.0 | 53.7 | 3.3 | 11 | 0 | 57.8 |
| Wilmington, North Carolina | 74.5 | 62.0 | 12.5 | 13 | 0 | 67.5 |

*Observation not taken on 9th.